

Translation

PATENT COOPERATION TREATY

PCT/EP2003/01174



PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference RG 585 PCT	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/EP2003/011744	International filing date (day/month/year) 23 October 2003 (23.10.2003)	Priority date (day/month/year) 30 October 2002 (30.10.2002)
International Patent Classification (IPC) or national classification and IPC F16L 37/098		
Applicant A. RAYMOND & CIE.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 3 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 25 May 2004 (25.05.2004)	Date of completion of this report 24 January 2005 (24.01.2005)
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/EP2003/011744

I. Basis of the report

1. This report has been drawn on the basis of *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.)*:

☐ the international application as originally filed.

☒ the description, pages 3-7, as originally filed,
 pages _____, filed with the demand,
 pages 1, 2, filed with the letter of Fax 18 October 2004 (18.10.2004),
 pages _____, filed with the letter of _____.

☒ the claims, Nos. 3 (partly), 4, 5, as originally filed,
 Nos. _____, as amended under Article 19,
 Nos. _____, filed with the demand,
 Nos. 1, 2, 3 (partly), filed with the letter of Fax 18 October 2004 (18.10.2004),
 Nos. _____, filed with the letter of _____.

☒ the drawings, sheets/fig 1/2, 2/2, as originally filed,
 sheets/fig _____, filed with the demand,
 sheets/fig _____, filed with the letter of _____,
 sheets/fig _____, filed with the letter of _____.

2. The amendments have resulted in the cancellation of:

☐ the description, pages _____

☐ the claims, Nos. _____

☐ the drawings, sheets/fig _____

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

4. Additional observations, if necessary:

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International application No.
PCT/EP 03/11744

I. Basis of the report

1. This report has been drawn on the basis of *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.)*:

The subject matter of claim 1 is the subject matter of the original claim 1 in a clarified, two-part form drafted in accordance with PCT Rule 6.3(b) with regard to the closest prior art US-A-2002/0135182.

The other claims have not been amended and the description has merely been brought into line with the amended claim 1.

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V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-5	YES
	Claims		NO
Inventive step (IS)	Claims	1-5	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-5	YES
	Claims		NO

2. Citations and explanations

The prior art closest to the invention is US-A-2002/0135182, which is acknowledged in the application and forms the preamble of claim 1, the only independent claim.

The characterizing features solve the technical problem of designing a joining element of this type in which, after the connection has been released, the snapping elements reliably return to their starting position, and permanent deformation or even fracture of these snapping elements as a result of their intended use is reliably prevented.

None of the prior art suggests the claimed solution according to claim 1, and this solution is also not regarded as belonging to the conventional technical ability of a person skilled in the art.

In particular, US-A-2002/0135182 does not disclose a joining element in which the snapping element arms pointing rearwards have free ends, a gap remaining between each free end and the opposing contact surface, and these free ends being bent back inwards.

The subject matter of independent claim 1 and *a fortiori* that of dependent claims 2 to 5 therefore meet the requirements of PCT Article 33(2) and (3).

The industrial applicability of the invention is specified in the description (PCT Article 33(4)).

It should be noted that the feature regarding the size of the gap is regarded as optional because the subject matter of claim 1 refers to the detent element of the counter piece in order to define this size, but the counter piece with its detent element is not necessarily part of the claimed joining element: "with which a detent element ... of a counter piece ... can be grasped" (PCT Guidelines, Chapter III, paragraph 4.8a and paragraph 4.6).

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EXAMINATION REPORT -- SUPPLEMENT

International Filing No. PCT/EP 03/11744

As to Item I

Basis of the decision

The subject matter of Claim 1 corresponds to the subject matter of the original Claim 1 in a clarified and, in correspondence with Rule 6.3 (b) PCT and with respect to the closest pertinent prior art, i.e., US-A-2002/0135182, properly phrased two-part form. The other claims remained unchanged, and the description was only altered to reflect the changes made to Claim 1.

As to Item V

Reasoned finding with respect to the novelty, the inventive activity and the susceptibility to industrial use; documents and explanations to support this finding

The closest pertinent prior art to the invention is document US-A-2002/0135182 which has been acknowledged in the application and which presents the preamble of Claim 1, the only independent claim.

The characterizing features solve the technical problem of making available a connecting element by means of which a reliable resetting of the snap-in elements into their basic position is ensured after the connection has been released and a permanent deformation or even fracture of these snap-in elements as a result of being handled as intended is reliably prevented.

No prior-art document contains references to the solution according to Claim 1, which solution can also be considered as not being part of the technical knowledge of persons skilled in the art.

Specifically, US-A-2002/0135182 does not disclose a connecting element, the rearwardly directed arms of the snap-in elements of which have free ends, between which ends and an oppositely lying contact surface a gap remains and which ends are inwardly bent backward.

Therefore the subject matter of independent Claim 1 and, a fortiori, the subject matter of dependent Claims 2-5 meet the requirements of Article 33 (2) and (3) PCT.

The susceptibility to industrial use of the invention is stated in the description pursuant to Article 33 (4) PCT.

It should be noted that the feature with respect to the size of the gap is to be considered a facultative feature since the subject matter of Claim 1 refers back to the latching element of the counterpart in order to define this size, with the counterpart with its latching element according to PCT guidelines III-4.8a and III-4.6 not compulsorily being an essential part of the claimed connecting element: "with which it is possible to reach behind a latching element [...] of a counterpart [...]."

The subject matter of the invention relates to a connecting element according to the preamble of Claim 1.

This type of connecting element is known from US 2002/0135182 A1. On the prior-art connecting element, the inwardly directed hooks, by means of which it is possible to reach behind a latching element of the counterpart, are molded to free ends of arms of two-armed latching elements, which arms, in the slip-in direction of a counterpart, are directed toward the front. To release the rear grip, outwardly upwardly bent arms which, in the slip-in direction of the counterpart, are directed rearwardly can be moved toward each other until the hooks are released from the latching element.

DE 41 18 463 A1 discloses a connecting element in which snap-in elements extending substantially parallel to the outside wall of the basic tubular body at their rocking point are connected to said outside wall by means of a curved, elastically deformable crosspiece. To the free end of the front arm of each snap-in element, the inwardly directed hook mentioned is molded, with each second arm extending at a radial distance to the basic body in a straight line toward the rear. To establish a connection, the connecting element with the front end of its basic body is pushed into the tubular junction part of a counterpart where it comes to a tightly fitting rest in a manner known from the prior art. At the same time, the hooks on the front ends of the snap-in elements reach behind an undercut that is formed into the outside wall of the counterpart, as a result of which the connection is secured against accidental release. To release the connection, radial pressure is exerted on the free ends of the rearwardly extending second arms of the snap-in elements, as a result of which the connecting crosspieces between the snap-in elements and the basic body act like a hinge and the hooks are released from their engagement so that the connecting element can be pulled out of the counterpart.

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The disadvantage of the prior-art connecting elements is that the connecting crosspieces and the rearwardly extending arms of the snap-in elements can be permanently deformed and even fractured when the latter are compressed too far into the direction toward the basic body in order to release the connection. Resetting the snap-in elements into their basic position is solely a function of the connecting crosspieces, which is not reliable. Furthermore, it was found that in certain cases, e.g., when in connection with standard operation, pressure is exerted on the connecting element or if they are pulled with great force, the hooks can become accidentally detached from their engagement to the counterpart.

Thus, the problem to be solved by the invention is to make available a connecting element of type discussed in the introduction by means of which a reliable resetting of the snap-in elements into their basic position is ensured after the connection has been released and a permanent deformation or even fracture of these snap-in elements as a result of being handled as intended is reliably prevented. In addition, it can be ensured with greater reliability that the connection cannot be accidentally released.

This problem is solved according to the present invention [sic] a connecting element of the type mentioned in the introduction with the characterizing features of Claim 1. By limiting the possible movement of the snap-in elements to what is functionally necessary, a permanent deformation of the snap-in elements is counteracted. The curved ends of the spring arms provide the snap-in elements with an effective resetting force.

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Claims

1. A connecting element as part of a quick connect unit for hydraulic or pneumatic connecting lines, with a tubular basic body (1) to which two diametrically oppositely lying and laterally spaced two-armed snap-in elements (5) are molded which, in their rocking position, are connected by means of an elastic connecting crosspiece (6) to the outside wall of the basic body (1) and which have inwardly directed hooks (11) on the free ends of their arms that extend toward the front, by means of which hooks it is possible, when establishing the connection, to reach behind a latching element in the form of an undercut on the outside wall of a counterpart (4) of the quick connect unit, with the rearwardly extending arms of the snap-in elements (5) being designed as spring arms (13), between the free ends of which spring arms and an oppositely lying contact surface a gap (a) remains, characterized in that the free ends of the rearwardly extending arms are inwardly bent backward and that the gap (a) is dimensioned so that the reach of the rocking movement of the spring arms (13) in the direction toward the basic body (1) is limited, which rocking movement corresponds to the expanding movement of the front arms of the snap-in elements (15) supporting the hooks (11), which expanding movement is necessary to release the engagement of said hooks (11) with the latching element (12) of the counterpart (4).

2. The connecting element as in Claim 1, characterized in that the spring arms (13) in their end section are first concavely curved slightly in the outward direction and subsequently curved back in the direction toward the basic body (1) and that the gap (a) limiting the rocking movement is disposed between the free ends of the spring arms (13) and the basic body (1).

3. The connecting element as in Claim 1, characterized in that the spring arms (13) in their end section are twice bent inwardly toward the rear and that thus an open loop (14) is formed, with the gap (a) between the free end of the open loop (14) and the inside surface of the respective spring arm (13) and with a rounded area (15) maintaining a gap (b) relative to the outside wall of the basic body (1), with first the gap (b) between the ... [text cut off] .. during a rocking movement of the spring arms (13) in the direction toward the basic body (1) ... [text cut off]